



State of Vermont

Agency of Human Services
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Date: March 5, 1997

RE: Hospital Readmission Rates

One of the outcome oriented performance indicators we selected for this first round of analysis focuses on inpatient readmission rates. In the MHSIP Consumer Oriented Report Card, admissions to psychiatric inpatient care within 30 days of discharge is one of two outcomes that measure concern for "minimal recurrence of problems." As was discussed at our last meeting, the measure we are testing is not exactly the same as the MHSIP Report Card measure because we do not have unique person identifiers in our data sets. Our measure specifies the number of people who were admitted during the month after the month of their discharge. (We have asked Steve Banks to investigate the mathematical relationship between our measure and the MHSIP measure of hospital readmissions. He will report back to us at our next meeting.)

The attached pages present the results of our application of the *probabilistic population overlap* methodology to an integrated inpatient behavioral health care data base. The data base includes basic information on every hospitalization of a Vermont resident under a mental health or substance abuse diagnosis that occurred in Vermont or New Hampshire during 1990 through 1994. Each record includes a hospital code, diagnostic codes, dates of admission and discharge, payor codes, and patient date of birth, gender, and zip code. The data set does not include any unique person identifiers.

The *probabilistic population overlap* methodology is a statistical procedure that provides an estimate (with known confidence intervals) of the number of people who are represented in two data sets that do not include common personal identifiers. The procedure uses known statistical properties of the distribution of dates of birth to derive this estimate. In order to apply the procedure to the measurement of hospital readmissions, two data sets were constructed and their overlap was measured. The first data set includes one record for each discharge of a Vermont resident who had

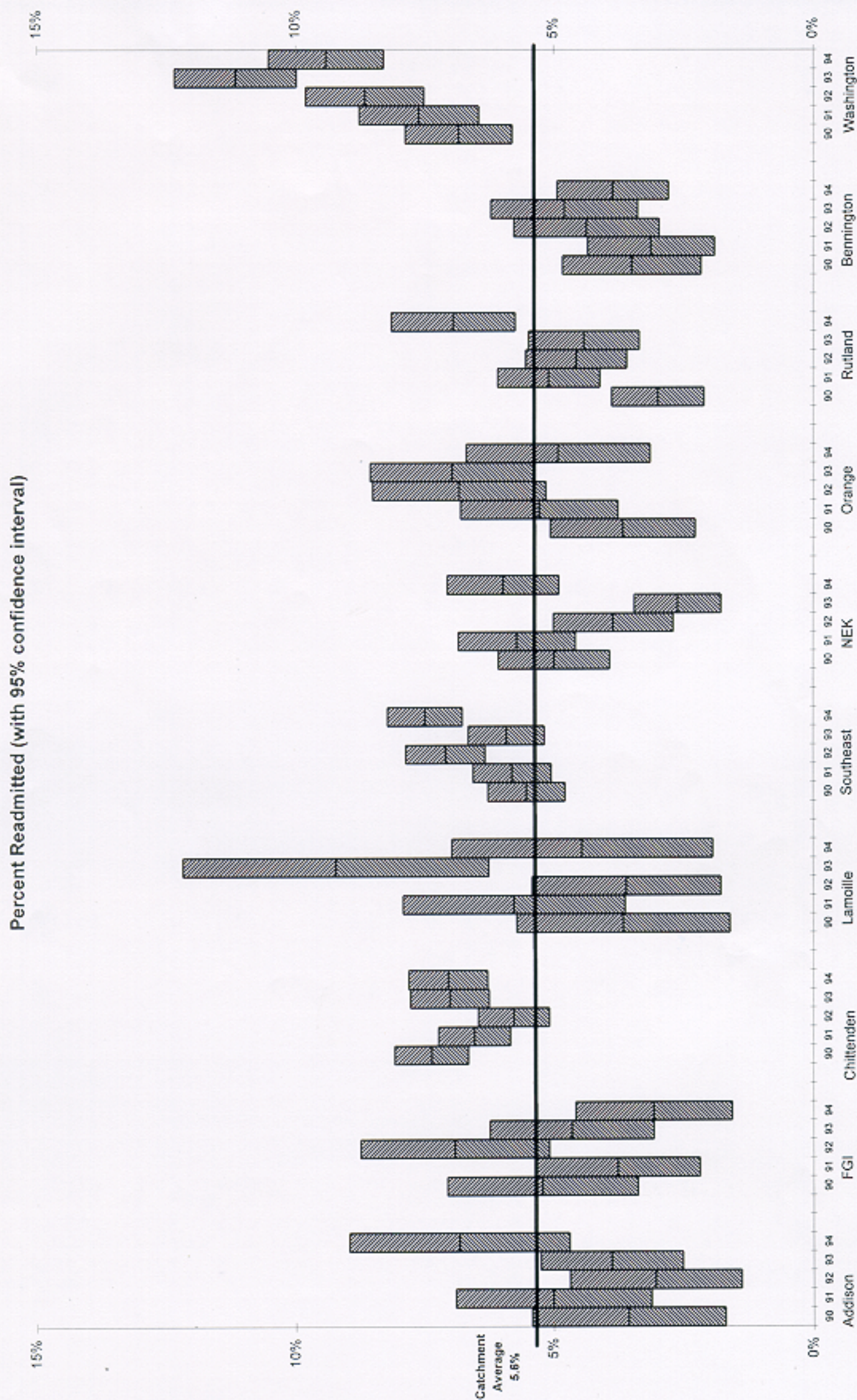
been hospitalized for mental health or substance abuse problems during a calendar month. The second data set includes one record for each admission of a Vermont resident for mental health or substance abuse problems during the subsequent calendar month. The number of people represented in both data sets provides the behavioral health care readmission rate for the period. The procedure was repeated for residents of each of Vermont's 10 mental health service areas for each month between 1990 and 1995.

The average readmission rate for Vermont service areas was 5.6% ($\pm .11\%$). This means that on average, more than 5% of the Vermont residents who were discharged from inpatient behavioral health care in Vermont or New Hampshire each month were admitted again to inpatient behavioral health care in Vermont or New Hampshire during the subsequent month.

The readmission rates varied among community mental health service areas and between years. As you will see, readmission rates for Washington County, Chittenden County and southeastern Vermont tend to be higher than the overall average. Readmission rates for Bennington County tend to be lower than the statewide average.

We look forward to discussing the results of this analysis with you at our next meeting on April 10. We look forward to your interpretations of the findings, as well as your thoughts on the quality of the data, the appropriateness of the analysis, and the presentation of the findings.

INPATIENT READMISSION RATES RESIDENTS ADMITTED FOR INPATIENT BEHAVIORAL HEALTH CARE DURING THE MONTH AFTER THE MONTH OF THEIR DISCHARGE BY CATCHMENT AREA AND YEAR: 1990 - 1994



INPATIENT READMISSIONS AND READMISSION RATES RESIDENTS ADMITTED FOR INPATIENT BEHAVIORAL HEALTH CARE DURING THE MONTH AFTER THE MONTH OF THEIR DISCHARGE, 1990 - 1994

Catchment Area	Number Discharged	Readmitted Next Month Number	Readmitted Next Month Percent	Catchment Area	Number Discharged	Readmitted Next Month Number	Readmitted Next Month Percent
Addison							
1990	96.3 + 3.8	3.5 + 1.8	3.6% + 1.9%	NEK	316.0 + 5.2	15.9 + 3.4	5.0% + 1.1%
1991	107.3 + 3.8	5.5 + 2.1	5.1% + 1.9%	1991	319.0 + 5.1	18.4 + 3.7	5.8% + 1.1%
1992	112.3 + 3.9	3.5 + 1.9	3.1% + 1.7%	1992	293.9 + 5.1	11.4 + 3.4	3.9% + 1.2%
1993	139.4 + 4.1	5.5 + 1.9	3.9% + 1.4%	1993	341.0 + 5.2	9.0 + 2.9	2.6% + 0.8%
1994	128.4 + 4.0	9.0 + 2.8	7.0% + 2.2%	1994	305.0 + 5.0	18.4 + 3.3	6.0% + 1.1%
FGI							
1990	140.4 + 4.1	7.5 + 2.6	5.3% + 1.9%	Orange	187.5 + 4.5	7.0 + 2.7	3.7% + 1.4%
1991	156.4 + 4.2	6.0 + 2.5	3.8% + 1.6%	1991	195.6 + 4.5	10.5 + 3.0	5.4% + 1.5%
1992	169.5 + 4.4	11.9 + 3.2	7.0% + 1.9%	1992	179.5 + 4.4	12.5 + 3.1	6.9% + 1.7%
1993	157.4 + 4.3	7.4 + 2.5	4.7% + 1.6%	1993	217.7 + 4.6	15.4 + 3.5	7.1% + 1.6%
1994	143.4 + 4.1	4.5 + 2.2	3.1% + 1.5%	1994	168.5 + 4.3	8.4 + 3.1	5.0% + 1.8%
Chittenden							
1990	764.7 + 6.7	56.7 + 5.5	7.4% + 0.7%	Rutland	347.1 + 5.3	10.5 + 3.1	3.0% + 0.9%
1991	783.8 + 6.7	51.6 + 5.5	6.6% + 0.7%	1991	358.1 + 5.3	18.4 + 3.6	5.1% + 1.0%
1992	660.3 + 6.4	38.4 + 4.6	5.8% + 0.7%	1992	357.1 + 5.2	16.5 + 3.5	4.6% + 1.0%
1993	683.4 + 6.5	48.3 + 5.2	7.1% + 0.8%	1993	323.0 + 5.2	14.4 + 3.5	4.5% + 1.1%
1994	671.4 + 6.4	47.6 + 5.2	7.1% + 0.8%	1994	325.0 + 5.1	22.8 + 3.9	7.0% + 1.2%
Lamoille							
1990	93.3 + 3.7	3.5 + 2.0	3.7% + 2.1%	Bennington	183.5 + 4.4	6.5 + 2.5	3.5% + 1.4%
1991	110.3 + 3.9	6.5 + 2.4	5.9% + 2.2%	1991	204.6 + 4.6	6.5 + 2.5	3.2% + 1.2%
1992	95.3 + 3.7	3.5 + 1.8	3.7% + 1.9%	1992	189.6 + 4.5	8.4 + 2.7	4.4% + 1.4%
1993	94.3 + 3.7	9.0 + 2.9	9.5% + 3.1%	1993	204.6 + 4.6	10.0 + 2.9	4.9% + 1.4%
1994	76.2 + 3.4	3.5 + 2.0	4.6% + 2.6%	1994	229.7 + 4.7	9.0 + 2.5	3.9% + 1.1%
Southeast							
1990	599.0 + 6.2	33.3 + 4.5	5.6% + 0.8%	Washington	395.3 + 5.4	27.3 + 4.1	6.9% + 1.0%
1991	578.9 + 6.1	33.8 + 4.4	5.8% + 0.8%	1991	368.2 + 5.3	28.4 + 4.3	7.7% + 1.2%
1992	599.1 + 6.3	42.8 + 4.6	7.1% + 0.8%	1992	408.4 + 5.5	35.8 + 4.7	8.8% + 1.2%
1993	691.4 + 6.5	41.2 + 5.1	6.0% + 0.7%	1993	400.3 + 5.5	45.2 + 4.8	11.3% + 1.2%
1994	722.6 + 6.5	54.5 + 5.3	7.5% + 0.7%	1994	422.4 + 5.5	40.2 + 4.8	9.5% + 1.1%

Information is derived from the Inpatient Behavioral Health Care Data Set maintained by DOMHS. This data set includes extracts from the Vermont State Hospital Database, the Brattleboro Retreat client database, and the statewide Hospital Discharge Data Set maintained by the Department of Health.

Analysis includes episodes of inpatient care of Vermont residents age 18 and older. Data includes all general hospitals in Vermont and New Hampshire, the Veterans Hospital in White River Junction, the Vermont State Hospital, and the Brattleboro Retreat. Catchment areas are DOMHS defined service areas and are based on the residence of people served.

Counts of discharges and readmissions are based on probabilistic population estimates. The probabilistic population overlap methodology is a statistical procedure that provides an estimate (with known confidence intervals) of the number of people who are represented in two data sets that do not include common personal identifiers. The procedure uses known statistical properties of the distribution of dates of birth to derive this estimate.